Clallam Transit System
ASSET MANAGEMENT PLAN

Maintenance Department

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INTRODUCTION

The Maintenance Department of Clallam Transit System (CTS) is responsible for and committed to providing safe, clean and mechanically reliable vehicles (fixed-route coaches, demand response vans, paratransit, vanpools, rideshare, microtransit and staff/support vehicles) for public transit operations throughout Clallam County and one reginal route serving the Bainbridge Island Ferry. It is CTS's goal to maximize the useful life and achieve the lowest life cycle cost of each asset by exercising a planned and extensive preventative/preservative maintenance program.

Each asset is managed with the intent to achieve the following:

- Minimize degradation of wearing parts and premature failures
- Maximize the asset's life through early detection of defects
- Allow proactive intervention to minimize catastrophic failures
- Minimize operator and customer exposure to accident and injury
- Minimize agency liability when incidents occur
- Maximize service reliability

Elements necessary to provide a quality standard of service are a fleet of mechanically reliable vehicles, adequate facilities, equipment to maintain the fleet, and skilled, motivated employees. To provide reliable service, the fleet size must reflect the peak requirement including spares to cover scheduled major repair work and preventative maintenance inspections.

The Maintenance Department is also responsible for the maintenance of all CTS owned facilities and maintenance equipment within the Clallam County service area. Facilities and equipment maintenance is approached and managed with the same principals as vehicle maintenance to maximize the useful life of and achieve the lowest life cycle cost by utilizing a planned preventative/preservative maintenance program. CTS proactively maintains its main combined facility located at 830 W. Lauridsen Blvd., Port Angeles utilizing a combination of hired staff and outside contractors. CTS also cooperatively manages and maintains jointly owned facilities under contract or agreements with the City of Port Angeles, City of Forks and the City of Sequim.

STATE OF GOOD REPAIR / USEFUL LIFE BENCHMARK

Under the Federal Transit Administration's (FTA) Transit Asset Management (TAM) final rule, CTS has established a State of Good Repair (SGR) goal and the agencies Useful Life Benchmark (ULB) for each applicable vehicle criteria in accordance with this final rule effective October 1, 2016.

CTS management has established SGR goal at 90 percent and a ULB for the fleet as described in the following table:

Vehicle Category	FTA Minimal Useful Life	CTS ULB
Support Vehicles – Standard	No Criteria	8 years / 150,000 miles
Support Vehicles – Specialty	No Criteria	18 years / 150,000 miles
Van – Vanpool	4 years / 100,000 miles	6 years / 150,000 miles
Van – Special Service	4 years / 100,000 miles	8 years / 150,000 miles
Cutaway Under < 30 feet	5 years / 150,000 miles	8 years / 225,000 miles
Heavy-duty Under < 30 feet	10 years / 350,000 miles	10 years / 350,000 miles
Body on Chassis Over > 30 feet	9 years / 250,000 miles	9 years / 250,000 miles
Heavy-duty 30, 35 & 40 feet	12 years / 500,000 miles	12 years / 500,000 miles
Heavy-duty 45-feet OTR	12 years / 500,000 miles	15 years / 650,000miles

LABOR ALLOCATION

The Maintenance Department is responsible for ensuring customer and operator satisfaction by providing equipment that is safe, clean, mechanically reliable, and maintained to acceptable standards.

To accomplish effective and efficient operation of the department and to support the overall goals of the agency, the current staff structure is separated into seven job categories. The number of personnel by job categories is: (1) Maintenance Manager, (1) Maintenance Office Manager, (1) Lead Fleet Technician, (3) Fleet Technicians, (1) Lead Maintenance Worker, (5) Maintenance Workers, (1) Custodian and (4) Cleaners.

The extended periods of system operation require varied shift assignments and appropriate staffing levels for each. Maintenance staff is required to be at the facility six days a week; weekday duty hours cover from 4:30 a.m. to 10:30 p.m. and Saturday hours are from 6:00 a.m. to 9:00 p.m. Special service may require additional staffing outside the hours identified. Determination of work schedules for vehicle maintenance staff requires the evaluation of several factors. These include:

- The availability of vehicles.
- Space available in the facility.
- Staffing levels.
- Service levels on each day.
- Pull-in and pull-out times for service.
- Most shifts have staffing levels of at least two employees and not necessarily the same classification; at times employees must work alone for periods, but work activities are limited, and communication is active for the safety of employees.
- Scheduled time off, i.e. vacations, sick leave, and holidays.

The majority of facilities maintenance is planned, scheduled and performed during the hours of 7:00 a.m. to 4:00 p.m. weekdays and in accordance with staffing levels. Emergency repairs may take place to vehicles, facilities or equipment at 24/7 depending on level of urgency.

LOCAL CONDITIONS

Local conditions have a direct impact on the level or frequency of preventative/preservative maintenance required for vehicles. Local conditions such as Service Design, Topography, Weather, and Standard Procedures must be considered when developing programs to maintain vehicles.

Service Design

- Rural and Regional service: Fixed Route, ADA Para-transit service and Demand Response and Rideshare.
- Due to our topography and service area of 1,753 square miles, CTS's average speed is medium to high with some vehicles traveling up to 80,000 miles per year.

Topography

- CTS territory serves the most NW corner of the Washington State. CTS is bordered by saltwater body to the north and mountains along the south. CTS's service ranges from in town stop and go service to longer distance routes that travel up to 72 miles one direction with infrequent stops in between.
- The terrain is fairly flat east and mid county, but as we travel towards the west end of the service area roads have more curves, with some grades and narrow roads with ingoing deterioration from moisture and more difficult for highway departments to maintain.

Weather

- A good portion of the year experiences rainy conditions and during the winter month's ice or snow on roadways can be expected along with precipitation. Adjustments must be made to our routine maintenance to prevent premature corrosion to our assets such as complete pressure washing of under chassis and components.

Standard Operating Procedures

- Exterior and interior cleaning is performed daily or more often as needed to preserve the condition of vehicles, provide sanitary conditions and to maximize safety by keeping lighting and windows clean and clear to optimum visibility.
- Pressure washing of engines, chassis and wheels is scheduled regularly and frequently to prevent corrosion surfaces and electrical.
- During winter months that become dry at times, road sand dust becomes more apparent and air filter intervals are adjusted accordingly.
- Preventative maintenance must be thorough and extensive to help minimize the potential for road calls in remote service areas. Resources are limited in many areas and service interruptions are very costly with extended recovery time due to the greater distances traveled.

WORKFORCE DEVELOPMENT

A small maintenance staff (relative to the size of the fleet, miles traveled and specific applications) maintains CTS vehicles. The philosophy chosen for workforce development is to seek maximum versatility through comprehensive understanding of the vehicle system. This means that CTS typically attracts, hires and develops versatile and bumper-to-bumper type of journeyman level technicians and limits specialization other than specializing in general transit bus repair and maintenance. Acknowledging that each individual brings specific skills and abilities to the workplace, nonetheless it is CTS intent to practice, to foster, and encourage maintenance employees to build a well-rounded work force and cross train employees at every opportunity.

Consistent with the desire for well-rounded technicians, recruitment to fill open positions should consider both internal promotion and hiring external of the agency as it applies to our policies and contractual agreements. In-house promotion suggests that the staff would have the necessary aptitude and skills required of the open position needing minimal education and training. Offering career growth through entry-level positions is desirable, but the limited staff does not always provide qualified applicants for higher level positions.

CTS employs Maintenance Workers to perform a multitude of tasks from general facilities and equipment maintenance including but not limited to; grounds keeping to fueling, inspections and organizing the cleaning of CTS vehicles. The Maintenance Workers, at times, may perform emergency vehicle repairs or scheduled component tear downs under direct supervision based on an individual's skill level or knowledge.

Communication

Policies and procedures are unique to organizations. Training of new staff as well as the ongoing or periodic retraining of all employees in the maintenance programs, policies and procedures is critical to achieving goals of providing safe and quality service. Current practice for the dissemination of information is through regularly scheduled monthly staff meetings, bulletin boards, memoranda, and one-on-one discussions with staff.

An employee orientation program is currently utilized. Specific common elements for all positions tailor the scope of this program. Primary issues during indoctrination include health and safety, departmental and

company organization, departmental policies and requirements, and basic orientation to the fleet and specific task requirements.

Training

Training is necessary for maintenance staff to become versatile and also to enhance the knowledge base of the maintenance program as a whole. Outside training (or bringing outside trainers in house) is the primary method of accomplishing this goal and is provided either by the Original Equipment Manufacturers (OEM) or through independent training facilities. Also available are the internal training programs and sub-departments of the larger Puget Sound transit systems such as the Washington State Transit Insurance Pool and Safety Skills LMS. Other training routinely takes place in cooperation with local government agencies and/or at times at the local community college automotive program.

On the job training by (employees training employees) has proven to be a successful part of our routine and bolsters communication and teamwork among employees. The Lead Mechanic is expected to attend training and then pass that knowledge and train our mechanics onsite.

Employee initiative continues to be encouraged by offering financial assistance for outside educational opportunities that supplement system provided training. An example is the payment of tuition for approved courses that could directly enhance the employees' knowledge and ability to maintain our fleet.

Future zero-emission training will consist of internal, external and OEM training opportunities that will be specific to makes and models the shall include hydrogen electric, hybrid electric and battery electric buses and service/support vehicles.

Environment

In addition to training, the most effective methods of performing specific tasks are dictated by important factors in the job environment. Procedures are developed based on available repair equipment within the maintenance facility.

When changes in a repair process or equipment occur, periodic evaluations of work activities must be conducted to watch for substantial time increases and to eliminate the potential for on-the-job injuries or other risks. The Maintenance Manager, with consideration of staff input, will evaluate and develop written department procedures or equipment changes to analyze the effectiveness, safety, and any result in cost or labor savings to optimize SGR of all equipment and facilities.

Identification of Critical Job Functions

The identification of critical job functions such as brakes, component rebuilds, inspection cycles, and other is a continuing effort. Staff input into the develop and conclusions is encouraged through open communication among the team.

WORK ASSIGNMENTS

The Maintenance Manager decides on a regular basis which tasks to be maintained by CTS staff and which repairs are be contracted or sourced out to the vendor network. The available labor resources, negotiated Union contract, cost of the items and the workload at any point determines the need for and balance to establish and exercise the most of all available resources.

Historically, CTS maintains a consistent balance between internal repairs, contract work and minimal outsourced repairs. This decision is made by management, influenced by employees and determined by workload, durability, cost, turn around, skills and ability.

For example, major engine overhauls periodically takes place in-house and has been determined to be at a value with improved quality and durability. Again, this is determined by turn-around time, current workload,

need for specialized tooling or availability technicians. Components, such as generators, have been determined to be substantially more durable and lower cost rebuilt in-house. Continuing a mixture of these activities constantly monitoring and evaluating in the best interest of employees and fleet maintenance services.

Exercising routine decision-making processes, the Maintenance Manager evaluates labor resources and daily workloads based upon CTS staffing levels and availability of qualified external resources. The primary considerations are safe operating equipment, timeliness of returning vehicles to service, economic considerations, quality control and personnel development including training opportunities.

Collision and paint work is typically outsourced to certified body repair facilities under contract or standard procurement methods with some repairs taking place internally that to not require paint body work.

Assignment of Tasks

The Maintenance Manager evaluates and determines which tasks are to be performed. These tasks are scheduled and coordinated by the Lead Mechanic or Lead Maintenance Worker under the direction of the Maintenance Manager. The Maintenance Office Manager will at times assist the Maintenance Manager with assignments and procedures as necessary or as directed.

The assignment of tasks requires continuous monitoring and evaluation. Priorities considered; safety, essential maintenance or elective maintenance, timeliness of returning a vehicle to revenue service and scheduled preventative maintenance to optimize SGR. Consideration is also based upon the skills relative to technicians and/or availability for assignment and the ability of replacement parts.

PREVENTATIVE MAINTENANCE

Preventative maintenance (PM) cycles are developed for all CTS vehicles at a minimum based upon the manufacture's recommendations including related components by the Maintenance Manager and the Lead Fleet Technician. Cycles and procedures are regularly monitored, evaluated and adjusted accordingly as necessary to ensure the best management of assets is achieved. Examples of components are but not limited to: wheelchair lifts, differentials, transmissions, engines, alternators, wheel bearings, turbo, air and emission systems. In most cases the manufacturer's recommendations are followed. In some cases, the intervals established may be adjusted based upon history exercising predictive maintenance when applicable. In these cases, in depth evaluation or analysis is performed prior to establishing a cycle. In all situations the goal of the maintenance programs is to enhance the quality and safety of the vehicle (or asset), minimize interruptions in service, and to reduce overall lowest lifecycle cost to the agency and optimizing SGR.

The analysis of fleet component specifics relies heavily on the quantitative and qualitative analysis of individual components. Variability in components suggests custom-tailored inspection intervals and methods must be applied in some cases.

Vehicle Inspection Scheduling

Vehicle inspections are forecasted and printed daily on a report before the scheduled inspection is due. The Lead Mechanic selects vehicles to be serviced based on the forecast report. The forecast report lists all vehicles mileage left until next service due and date of last service performed. Vehicles are scheduled for inspections due at 3K, 5K, or 6K mile intervals. CTS's goal is to perform PM inspections within 300 miles of the targeted inspection due mileage. Inspections are established on mileage intervals and backed up by calendar day intervals in case mileage levels are not reached. Repair orders are reviewed and coded daily by the Maintenance Office Manager and Lead Fleet Technician to ensure proper parts and labor allocation. The Maintenance Manager performs essential tasks during an absence of the Lead Mechanic or Office Manager.

Facilities Inspection Scheduling

Facilities inspections are performed on a scheduled basis. This includes equipment and components within each facility. Inspections or preventative maintenance is scheduled by time such as daily, weekly monthly, annually, etc. This is based on manufacturer's recommendation, history, local or federal requirements and duty-cycle. Alternative inspection cycles may also be developed for facilities maintenance based on history and authorized by the Maintenance Manager. The Lead Maintenance Worker utilizes a manual spread sheet listing each equipment or element within each facility requiring scheduled maintenance. Work is then scheduled and identified by a "project number" and a history of records is maintained. Detailed checklists are developed, utilized and custom tailored to each facility maintained by CTS. Defects, discrepancies or deterioration is listed in detail and assigned a project or work order number for the timely repair. Checklists are signed when repairs are validated complete. Projects deferred due to weather, scheduling or contracting are so noted with expected completion date. Each facility is scheduled monthly for inspection and every maintenance employee is to inspect the facility and equipment periodically throughout each shift within their immediate work area.

Some examples of components maintained within, or services performed to preserve the life of a facility are but not limited to; HVAC, janitorial services, painting, grounds keeping, water filtration, catch basins, lighting, irrigation, pressure washing and structural integrity.

Equipment Inspection Schedule

Based upon manufacturer's recommendations, inspection cycles and checklists are developed for each piece of equipment. Intervals are scheduled on the CTS Equipment Service Schedule chart. The Lead Maintenance Worker assigns inspections and repairs to be performed by Maintenance Workers.

Some examples of equipment maintained are but not limited to, automatic bus washer, vehicle lifts, air compressor, surveillance systems and grounds equipment.

INFORMATION SYSTEMS

Clallam Transit utilizes Avail Technologies Inc., Enterprise Transit Management Software (ETMS), an integrated software system and has for several years now. This system stores history and generates accurate reports.

The ETMS software applications of greatest benefit to maintenance are the inventory management, vehicle maintenance and reporting applications. In addition, certain personnel applications are also essential such as timekeeping and human resources.

Vehicle Maintenance Module

The ETMS Vehicle Maintenance Module consists of a series of programs designed to monitor and record vehicle maintenance activities and associated costs. Preventative maintenance inspections, parts usage and costs, and general maintenance activities are recorded in this system.

Each vehicle is individually identified and grouped into a sub-fleet. Pertinent fleet and vehicle or asset information such as vehicle type, status, year, fuel type, fuel tank capacity, seating capacity and expected fluid consumption parameters is recorded for each vehicle.

Vehicle service data is entered into the system daily. Fuel and oil usage are entered, and any exception data is noted for low performance. Mileage is updated daily and vehicles due for inspection are identified and scheduled.

As the daily service data is entered into the system, costs are calculated, and appropriate general ledger transactions are generated. Cost information is available for each job, vehicle and sub-fleet. Inventory levels of items used, i.e. parts, fuel, and oil, are automatically reduced as usage is entered into the system.

Various reports are available such as monthly maintenance report, exception reports, and inspections due report.

Tire position, date and mileage are also tracked automatically after once data is entered within the system. The Fleet Technicians note tire branding number identification on the work order when a tire change takes place, and the Lead Fleet Technician enters or changes the position on the designated vehicles within the system.

PARTS INVENTORY MANAGEMENT

The vehicle maintenance parts inventory function operates under the management of the Maintenance Manager. The Maintenance Office Manager and the Lead Fleet Technician perform the ordering and receiving function of the parts inventory flow. The Lead Fleet Technician orders the parts by purchase order through a requisition system. Purchase orders are also issued from the Maintenance Department under the supervision and authorization of the Maintenance Manager. The Maintenance Manager performs critical tasks during an absence of the Lead Fleet Technician or Maintenance Office Manager.

Purchases, receipts, issues, and adjustments to inventory are processed and tracked by the ETMS computer software program. Usage reports, physical-to-book comparisons, and costing are also supported by the computer system. The system stores history and generates reports. Parts are identified tracked by bar code using a CTS internal item number.

The ETMS Inventory Management Module processes and tracks purchases, receipts, issues, and adjustments to inventory. In addition, through this module:

- Outstanding purchase orders are processed
- Multiple inventory locations are tracked
- Usage reports, physical-to-book comparisons, costing, and work order summary reports are generated

Historical usage reporting provides an analysis of usage by month during the current year as well as the amount consumed during the prior year. The module automatically interfaces to the general ledger. This allows inventory issues to be charged to the appropriate general ledger expense accounts and automatically reduced from the appropriate inventory account.

CTS operates an open parts room concept. Leads, Technicians and Maintenance Workers obtain needed parts from the parts warehouse and scan their employee number, work order number and part number using a bar code reader or manually entering bar code. Parts listed on work orders are downloaded and tracked daily to adjust levels and reports are reviewed to implement the restocking process. Parts stock levels are determined by the frequency of use, delivery lead times, the effect on service if unavailable, weather considerations and the condition of the fleet. The goal is to minimize inventory maintaining parts to support a sufficient number of vehicles available for revenue service at all times without compromising availability of vehicles or equipment.

Decisions on stock levels are aided by the computer system. Minimum and maximum stock levels are set by the Lead Fleet Technician under the direction of the Maintenance Manager.

Inventory verification is done annually through a physical inventory. Adjustments are made as parts are reordered or when random spot checks of inventory levels are performed. A complete parts inventory is scheduled and takes place during the first week of February. A goal if less than one percent discrepancy is targeted.

EQUIPMENT MANAGEMENT

Coaches

CTS coaches are projected to be replaced at the end of their designated life cycle. The useful life ranges from 8 to 15 years depending on medium to heavy duty rating. Replacement is driven by CTS's ability to obtain grant funding and ability to provide matching funds from the capital budget. Depending on success of award of grant funding and financial position, vehicles may be kept in use beyond their designated ULB. CTS revenue vehicle purchases typically consist of one up to ten buses at a time. Five to ten coaches purchased within one calendar year would be considered a large purchase.

The CTS fixed route fleet consists of 29, 35, 40, and 45-foot heavy-duty coaches to meet various service demands throughout Clallam County.

ADA Service Vehicles – Para-transit

CTS operates complimentary ADA service three-quarter mile corridor throughout Clallam County. CTS utilizes 20 cut-away vehicles to provide this service. The vehicles are typically kept in service until reaching approximately 250,000 miles. Depending on CTS's ability to obtain Grant Funding, vehicles may be kept in use beyond their designated useful life.

Rideshare (Vanpool) Vans

Vanpool vans are another significant vehicle sub-fleet. One group of passengers generally keeps the van for the life of the vehicle. Due to the variety of distances traveled, van life may range from four to seven years depending on the mileage and condition of each vehicle. Some groups are utilizing these vans up to seven days a week and averaging 100 miles per day. This program operates in the service area. Due to the daily distance traveled the mileage tallies up quite rapidly. CTS continues to maintain capital funding for replacement vans. This fleet currently is a makeup of unleaded fueled vans based in the Forks area and dedicated propane powered vans based in the Port Angeles area.

Beginning in 2022 CTS is rebranding this service to be titled Rideshare and is planning to expand the types of vehicles to minivans and sedans in an effort to grow the program and offer multiple options where appropriate.

Staff and Support Vehicles

The variety of this vehicle sub-fleet is due to the varied needs within the agency. Due to the size of the fleet and relatively slow growth, this fleet is expected to remain a varied-age and varied-type conglomeration of vehicles. Service decisions will be made on an individual vehicle rather than a fleet basis. CTS strongly alternative fuel for this fleet on a routine basis as choices become available. This fleet currently is made up of diesel, unleaded, hybrid and propane fueled vehicles.

Previously support vehicles have been, at times, operated for over ten years and up to approaching 200,000 miles before replacement occurs. To minimize life cycle and overall costs.

Future Vehicle Procurement

All vehicles procured after June 1, 2018, are subject to the provisions and rules under the RCW 43.19.648 for the practical use of electricity and biofuels to fuel local government agencies in the State of Washington. CTS shall procure all its rolling stock and service/support vehicles under the rules developed to satisfy the regulation with a goal to move vehicles to zero-emission as technology becomes available to satisfy the necessary duty-cycle specific to the operation. Currently CTS is operating plug in hybrid vehicles and has on order two electric vehicles for future replacement.

Early 2023 CTS shall be completing a zero-emission feasibility study to determine the zero-emission technology that best suites the rural area operated in. The current vehicle replacement schedule identifies electric or hydrogen-electric buses in the forward replacement cycle consistent with CTS's zero-Emission Transition Plan.

WORK PERFORMED BY OTHERS

A small portion of CTS's vehicles are maintained at the Quillayutte Valley School District (QVSD) in Forks, WA. This location supports CTS's west-end or Forks area base. The maintenance agreement contract outlines the necessary elements required to properly maintain our assets at these locations. The vehicles inspected and repaired at these locations is determined by CTS and driven by the assigned vehicles geographic service area. This is a necessary element in achieving the lowest life cycle cost of our assets servicing remote locations within our service area. Maintaining vehicles closer to their area of operation minimizing cost associated with dead heading vehicles ~ 55 miles for routine maintenance and repair. All work is scheduled and monitored by CTS management or designated staff such as lead personnel and utilizing CTS PM checklists and maintenance module. Maintenance records are kept at both locations with master records at CTS. The Maintenance Office Manager reviews and approve all transactions and work orders and the Maintenance Manager performs periodic site visits/audits at contract repair facilities to inspect quality of work and as an added system of evaluating vehicle condition. Vehicles are routinely brought back to the main facility and inspected by CTS staff. Routine maintenance and major repairs of vehicles assigned to operate in the Forks service area are routinely rotated for maintenance or repair at CTS's Maintenance Facility by CTS Staff.

WARRANTY RECOVERY

Vehicles

Vehicles (assets) and major components are tracked utilizing the ETMS software program which incorporates a user flagging system to alert employees of active warranties. These assets are logged and warranty periods for vehicles and components are tracked and monitored regularly. Warranties are either based by time period or miles traveled. CTS is reimbursed for labor and parts, or work may be performed by an authorized dealer or vendor if applicable. Parts are also tracked using the ETMS software program. Parts are evaluated at time of failure by the Lead Fleet Technician or Maintenance Manager to determine if a warranty does apply.

Warranty claims are prepared by the Lead Fleet Technician, Maintenance Manager or the Maintenance Office Manager and processed by the Finance Department. Proper credit and accounting adjustments are then made by the finance/accounting department.

Facilities/Equipment

An individual file record is maintained on each facility, each piece of equipment or component within a CTS facility that requires a scheduled maintenance program. At time in which an element or component has failed within a facility, the Lead Maintenance Worker researches each situation individually to verify if a current warranty exists. Warranty repairs may be scheduled by an authorized contractor or repairs are made by CTS personnel and parts are typically exchange for new or remanufactured.

All department purchases are required to be approved by the Maintenance Manager. This results in a final verification if a failure was premature and/or under a valid warranty period.